

REMARKS

Claims 1-18 were pending. Claims 1, 2, 6, 7, 12, 13, 14, and 17 are amended and claims 10 and 18 are cancelled. Claims 19-23 are newly added. Upon entry of the amendment, claims 1-9, 11-17, and 19-23 are now pending.

Support for the amendments to the claims and for new claims 19-23 is found widely in the specification.

With specific regard to claims 1, 7, and 14 and new claim 22, which recite “wherein the partitioning tracer is selected from the group consisting of a halogenated aliphatic compound, a weak acid, a weak base, and a polar organic compound,” Applicant kindly directs Examiner’s attention to claim 10 as originally filed, and to page 7, lines 23-27.

Claim 6 is amended for clarification and is supported by the specification as originally filed, including page 7, lines 19-21.

The amendment to claim 7 is further supported by the disclosure at page 21, line 22, which shows exemplary use of two different detectors for measurement of tracer gases.

Support for the amendments to claim 12 is found in the specification at page 8, lines 3-24, and elsewhere, which discloses use of the methods of the invention in materials other than landfills. Claim 12 is further amended to more particularly claim the invention. Claim 13 is amended to conform to claim 12 from which it depends.

Claim 17 is amended to clarify the claim and not to limit the scope of the invention.

With regard to new claims 19 and 23, the use of the specific partitioning gases 1,1,1-trifluoroethane and difluoromethane is found on page 7, lines 24-25. Use of fluoromethane as a gas similar to difluoromethane with regard to properties important for use as a partitioning tracer is found at page 29, line 18.

Claim 20 is supported by the table that spans pages 22 and 23 and by disclosure on page 26, lines 12-13 which discloses a range of water saturation values.

Claim 21 is supported by the claims as originally filed and by the specification at page 8, lines 3-24.

No new matter has been added.

Item 1

Claim 2 has been amended to correct the informality. In particular, the period before the word difluoromethane has been deleted.

Item 2-3. Rejection under 35 U.S.C. §112(2)

Claim 5 was rejected as indefinite as to whether plural conservative tracers are claimed.

Claim 5 has been amended to recite: “wherein said conservative tracer has a low affinity...” Thereby the antecedent basis is clarified.

Items 4-5. Rejection under 35 U.S.C. §102

Claims 1, 3, 6, 7, 11, 14, and 17 stand rejected under 35 U.S.C. 102(b) as anticipated by the cited abstract by Briening et al. (Briening).

With regard to claim 1, the Office Action recites that Briening discloses measuring water within solid waste by injecting two gas tracers within the solid waste. Office Action at page 3. Briening is said to disclose that one gas is conservative (i.e., non-reactive) and the second gas tracer partitions into water and is separated from the conservative tracer during at least a portion of the method.

Claim 1 as amended specifies that the second gas tracer is selected from the group consisting of a halogenated aliphatic compound, a weak acid, a weak base, and a polar organic compound. Nowhere does Briening teach this element with particularity or even suggest its use.

Consequently, claim 1 as amended is not anticipated by the Briening reference.

Claims 3, 6, and 11 depend directly or indirectly from claim 1 and incorporate all the limitations thereof.

For at least the above reasons, Applicants respectfully request withdrawal of all rejections of claims 1, 3, 6, and 11, as amended, over Briening.

With regard to claim 7, the Office Action relies on Briening to disclose a conservative (e.g. non-reactive) tracer and a partitioning tracer. Office Action at page 3.

Applicants respectfully assert that Briening does not disclose all the elements of claim 7 as amended.

For the reasons provided above, claim 7 as amended is not anticipated by Briening. In particular, Briening does not disclose selecting a partitioning gas selected from the group consisting of a halogenated aliphatic compound, a weak acid, a weak base, and a polar organic compound.

With regard to claims 14 and 17, the Office Action states that Briening discloses one tracer is conservative (e.g. non-reactive) within the landfills, and the second gas tracer partitions into water. Briening is relied on to disclose a conservative tracer which has an inherent function of not partitioning significantly into solids/liquids. Briening is further relied on to disclose a partitioning tracer which has the inherent properties of partitioning into water in landfills but has minimal affinity for gas-water phase interface or for solid waste.

As an initial matter, Briening does not anticipate claim 14 as amended or claim 17 because Briening does not disclose a partitioning tracer gas selected from the group consisting of

a halogenated aliphatic compound, a weak acid, a weak base, and a polar organic compound. Secondly, inherent anticipation requires that the expected result necessarily and invariably follows from the disclosure. Within a wide range of possible partitioning gases, only three classes are claimed. Thus, the Briening disclosure cannot necessarily and inevitably lead to claim 14 as amended, or claim 17.

Items 6-7. Rejections under 35 U.S.C. §103

Claims 2, 4, 5, 8-10, 12, 13, 15, 16 and 18 stand rejected as obvious over Briening. Claims 10 and 18 have been canceled. Consequently, the rejection of claims 10 and 18 are moot.

With regard to claims that depend from claims 1, 7, or 14, the claims are not obvious over the Briening abstract because it does not identify specific classes of partitioning gas tracers nor does it provide any information that would lead one of ordinary skill in the art to select a partitioning gas tracer in the claimed classes. Without the specific disclosure provided by the inventors in the instant application one of skill in the art would confront a nearly endless list of possible choices and interminable investigation to choose the partitioning gas tracer as claimed in amended claim 1. The bewildering range of possible choices is not limited to the three broad categories identified on page 17, lines 20- page 18, line 1, i.e., (1) halogenated aliphatic compounds, (2) weakly acidic gases and weakly basic gases, and (3) polar organic compounds. Not only does Briening not identify the claimed classes of partitioning gas tracers, it provides no guidance for selecting among such classes.

With specific regard to claim 2, the Office Action relies on Briening to disclose a conservative (e.g. non-reactive) tracer and a partitioning tracer. The Office Action further states that while Briening does not specifically disclose that the tracers are helium and difluoromethane, the court held in *In re Leshin*, 125 USPQ 416 (CCPA 1960) that the selection of a known material based on its suitability for the intended use is a design consideration within the skill of the art. Therefore, the Office Action concludes, it would have been obvious to one of ordinary skill in the art to employ Briening to determine the use of helium and difluoromethane.

In re Leshin is readily distinguishable from the facts of the present application. In *Leshin*, the applicant sought claims to a plastic container-dispenser such as would be suitable for stick deodorant in view of prior art that “shows a similar [lipstick] container of molded plastic.” *Id.* at 417. The court found that “[m]ere selection of known plastics to make a container-dispenser of a type made of plastics prior to the invention, the selection of the plastic being on the basis of suitability for the intended use, would be entirely obvious.” *Id.* at 417-418.

Unlike the situation in *Leshin*, where the prior art taught specific plastics suitable for a container-dispenser, Briening does not teach any specific gas. Briening gives no example of a gas suitable for use in the invention. Thus in the present matter one of ordinary skill in the art must start with all known gases, to choose both a conservative gas tracer and a partitioning gas tracer. That situation is completely unlike *Leshin* in which the prior art taught the use of a known plastic.

Moreover, in *Leshin* the inventor merely picked one plastic. By contrast, in the present matter one of skill in the art would need to pick two gases using different criteria.

Further unlike *Leshin*, Briening does not provide any basis for selecting a partitioning gas selected from the group consisting of a halogenated aliphatic compound, a weak acid, a weak base, and a polar organic compound, let alone difluoromethane.

Indeed, in *Leshin* the uses of the plastics in the invention and the prior art were highly related, such that even similar containers were used. In distinction, the present specification makes clear that not all partitioning gases are suitable for the determination of water in landfills. As identified in the specification, many partitioning gases are not at all suitable. Identifying the claimed combination of gases can not be obvious in view of the many such known gases and the particular requirements for analysis in landfills.

Moreover, Briening gives only the most rudimentary help in choosing a partitioning gas, specifically that the gas “partitions into and out of free water trapped within the pore space of the solid waste.” Thus, Briening has only a functional definition and provides no structural guidelines at all. In particular, Briening provides no exemplary partitioning gas-even a poorly

performing one. By contrast, in *Leshin* the prior art specifically taught the use of a particular plastic for the same purpose as claimed by *Leshin*'s application.

In further distinction to the facts of the *Leshin* case, the instant application (unlike Briening) teaches how to select a tracer gas, including a partitioning gas. Page 16, line 10 – page 19, l. 19. Not all partitioning gases are equally suitable. An extensive theoretical foundation is also provided including data on salt and temperature effects on partition coefficients. Page 19, line 20 – page 30, line 14.

Moreover, unlike Briening, several exemplary partitioning gases are disclosed in the instant application. Page 17, line 20 – page 18, line 3. A preferred partitioning gas is also provided. Page 18, lines 3-4.

Most particularly, Briening does not in any way teach or suggest use of helium and difluoromethane as tracer gases.

In consideration of obviousness it is also important to establish the credentials of “the person of ordinary skill in the art.” If the person of ordinary skill in the art is a landfill manager, such a person would be very unlikely to be able to identify classes of partitioning gases suitable for use as a tracer in a landfill for measurement of water content in the landfill because such information would be far outside the fund of knowledge needed to manage a landfill. If, in the alternative, the person of ordinary skill in the art was accomplished in the field of vadose ground water measurements, that person would also be unlikely to be able to identify classes of partitioning gases suitable for measurements in landfills because a person in the field of vadose ground water measurements would be unfamiliar with the special features that landfills present. For example, landfills are warmer than soils, are more inhomogeneous than soils, and generate many of the gases that would otherwise be suitable for use as partitioning gases. Fortunately, the inventors have spanned both bodies of knowledge and in so doing having identified a new and highly useful invention.

For at least the above reasons, the rejection of claim 2 as obvious over Briening should be withdrawn.

With regard to claims 4 and 5, the Examiner cites *In re Leshin* and a parallel argument to that used for claim 2.

Unlike the situation in *Leshin*, where very similar or identical materials were chosen for the same or similar purposes as in the prior art, the instant invention solves a new problem with a new approach and new materials. In particular Briening does not disclose use of a noble gas or a perfluorinated compound as a conservative tracer. One of skill in the art would have little basis for making a selection. Moreover, claims 4 and 5 depend directly or indirectly from claim 1 as amended, and incorporate all the limitations thereof, which limitations are not disclosed in Briening. Moreover, the arguments presented above for claim 2 apply to the non-obviousness of claims 4 and 5. For at least these reasons, withdrawal of all rejections of claims 4 and 5 is requested.

With regard to claims 8 and 9, the Office Action applies a parallel argument as used for claim 2, relying again on *Leshin*.

Claims 8 and 9 depend from claim 7 as amended, which, for at least the reasons provided above, is neither anticipated nor obvious over Briening. Consequently, claims 8 and 9 which incorporate all the elements of claim 7 are also not obvious over Briening. Moreover, the arguments asserted with regard to claim 2 above also render claims 8 and 9 non-obvious.

In addition, Briening does not suggest, or suggest a need for, tracers that are nontoxic. Similarly, Briening does not identify nonbiodegradability of a tracer as a desirable quality. One of skill in the art would have no identified basis for selecting the qualities that limit claim 8. *In re Leshin* is not applicable to this ground of rejection of claim 8 because *Leshin* is directed to selection of known materials. In contrast, claim 8 introduces new limitations that cannot be found in Briening.

Similarly, with regard to claim 9, Briening does not suggest, or suggest a need for, tracers that are absent from landfill gas or are present at negligible concentrations in landfill gas. Applicant respectfully requests the Examiner's aid in pointing to any inference or suggestion in Briening to use gases absent in landfills. In the absence of such text, Applicant respectfully

maintains that there is no basis in Briening for selecting tracer gases that are absent from or at negligible concentrations in landfill gas. Moreover, for the same reason as identified above for claim 8, *Leshin* is not applicable to this ground of rejection of claim 9.

For at least the above reasons, withdrawal of all rejections of claims 8 and 9 is respectfully requested.

Claim 10 has been cancelled and its rejection is mooted.

With regard to claims 12 and 13, the Office Action relies on Briening to disclose measuring water within solid waste by injecting two gas tracers within the solid waste/landfills. Office Action at page 7. The Office Action recites that Briening does not specifically disclose measuring water in a biofilter. The Examiner relies on *In re Pearson*, 494 F.2d 1399, 181 USPQ 641 (CCPA 1974); *In re Yanush*, 477 F.2d 958, 177 USPQ 705 (CCPA 1973); *In re Finsterwalder*, 436 F.2d 1028, 168 USPQ 530 (CCPA 1971); *In re Casey*, 370 F.2d 576, 152 USPQ 235 (CCPA 1967); *In re Otto*, 312 F.2d 937, 136 USPQ 458 (CCPA 1963) and *Ex parte Masham*, 2 USPQ2d 1647 (Bd Pat App & Inter 1987), that “a recitation with respect to the manner in which *an apparatus* is intended to be employed does not pose any *structural limitation* upon the claimed *apparatus* which differentiates it from a prior art reference disclosing the *structural limitation* of the claim.” (Emphasis added).

Applicant respectfully points out that the Office Action inappropriately relies on case law directed to use of an *apparatus* which has *structural limitations*. Quite unlike the cases cited, claims 12, as amended, and 13 are directed to a method suitable for measuring water in engineered porous media. Claims 12 and 13 are not directed to an *apparatus* but to a method of measuring water. Also, importantly, the *structural limitations so prominent in the Office Action’s recitation of the cases* have no easy parallel in claims 12 and 13.

In addition it is a tenet of patent law that a new use for an old compound is patentably distinct from the prior use. Briening admittedly does not disclose measuring water in a biofilter, nor does it disclose measurements in engineered porous media, so the use of the dual gas tracers in biofilters (and engineered porous media) is new. Moreover, biofilters are not necessarily

associated with landfills and one of ordinary skill in the art would find no motivation in the reference to apply the teaching of Briening to a different subject matter.

For at least the above reasons Applicants respectfully request withdrawal of the rejections of claims 12 and 13 as obvious over Briening.

With respect to claims 15-16, the Office Action relies on *In re Leshin* and states that selection of a known material based on its suitability for the intended use is a design consideration with the skill of the art.

Contrary to the assertions in the Office Action, for reasons provided above, the invention claimed in claims 15-16 is not a mere selection as Briening provides no structural or exemplary guidance. Notably Briening does not disclose or suggest the importance of using non-toxic, non-biodegradable gases. With regard to claim 16, Briening does not disclose or suggest using a noble gas or perfluorinated compound. Moreover, claims 15 and 16 depend from claim 14 which is non-obvious over Briening, for reasons presented above.

Withdrawal of the rejections of claims 15 and 16 is respectfully requested.

For at least the reasons presented above, it is believed that all pending claims as amended are in condition for allowance.

The Commissioner is authorized to charge our Deposit Account No. 03-2775 for the fee for one additional claim. Applicant believes no other fee is due with this response. However, if a fee is due, please charge our Deposit Account No. 03-2775, under Order No. 00131-00345-US2 from which the undersigned is authorized to draw.

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Respectfully submitted,

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